

# HIREC™ 100

High Repellent Coating

## Roller Application



## Product Information & Application Instructions

### **DISCLAIMER**

HIREC, a coating for use on telecommunication antennas including radomes, prevents signal attenuation caused by snow, ice adhesion, or a water layer on the surface of the antenna. NTT-AT's warranty of this product only applies when HIREC is properly applied according to the provided instructions. If you do not have access to the instructions please contact NTT-AT at (408)392-4280. NTT-AT does not guarantee the effectiveness of this product depending on the presence of rime ice, high frequency, and the antenna's material, size, and shape.

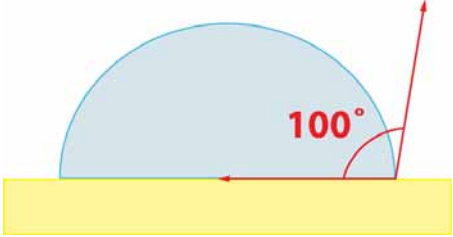
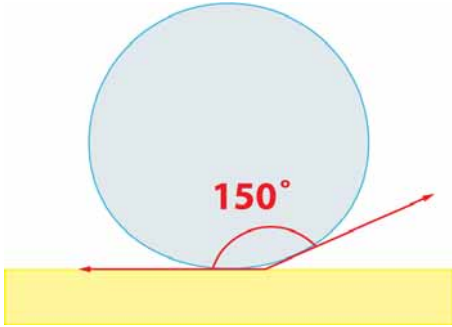
**PLEASE READ CAREFULLY BEFORE USE**

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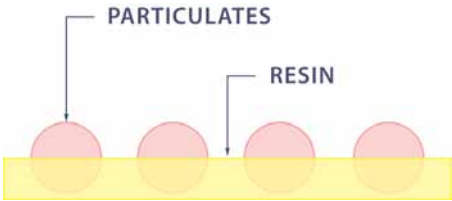

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## What is HIREC™?

HIREC is an advanced superhydrophobic coating material for the protection of high-value equipment against water-related damage. Unlike conventional water-repelling materials, water droplets do not stick to surfaces treated with HIREC; as a result, HIREC is able to provide exceptional protection against not only ice and snow, but also the gradual accumulation of water film.

Conventional Water Repellents	HIREC High Repellent Coating
	
<p>When water comes in contact with a solid surface that had been treated with conventional water repellents, the droplets spread out over the surface and typically create a contact angle of approximately 100 degrees.</p>	<p>In contrast, surfaces treated with HIREC High Repellent Coating have a water contact angle of more than 150 degrees, minimizing the area of contact between water droplets and the surface.</p>

This is achieved as a result of the unique composition of the HIREC coating material, which combines miniscule PTFE particulates and a fluorinated resin. When applied to a solid surface, the particulates and resin disperse to create a textured surface; when this surface is exposed to water, the droplets come in contact only with the raised particulates and easily roll off.

	
<p>When HIREC is applied to a surface, the PTFE particulates and resin create a textured surface.</p>	<p>Water droplets are repelled by this textured surface and easily roll off.</p>

**HIREC 100** is a water-repelling material with anti-fouling properties. It is most effective in protecting against damage from water and snow, and its water-repelling performance last for approximately 3 years. NOTE: HIREC 100 requires the application of a primer coating

## **Before you start:**

Please make sure that the ambient temperature does not drop below 45F° while applying and drying the coating. The recommended ambient temperature is above 68F°.

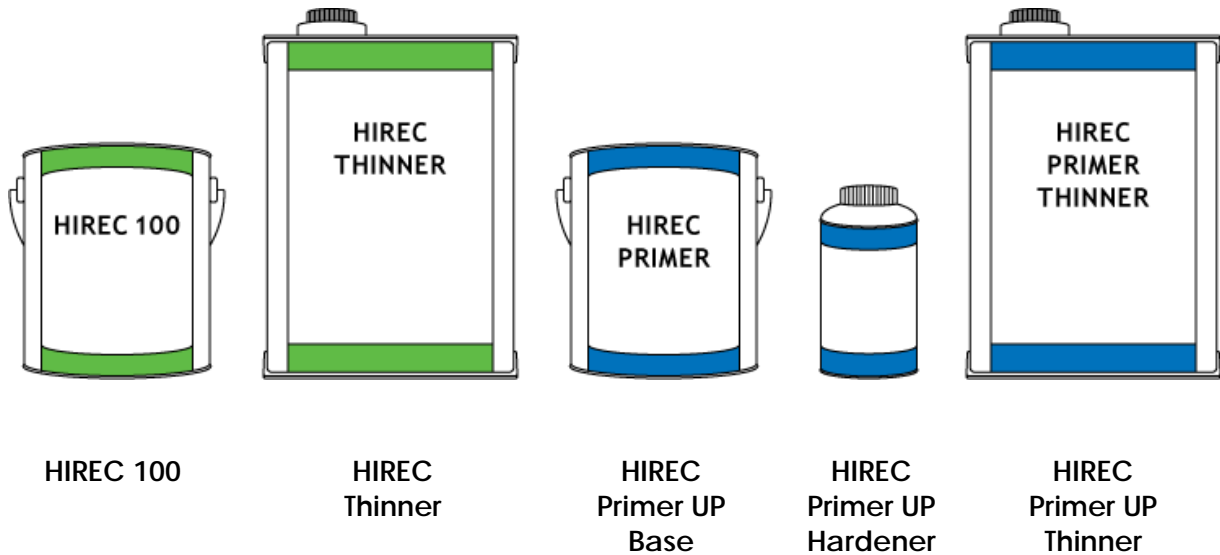
You will need:

- HIREC100, HIREC Thinner, HIREC Primer Up Base, HIREC Primer Up Hardener, and HIREC Primer Up Thinner
- Masking Materials
- Gloves, mask, and eye protection
- Lint-free cloth
- Cleaning alcohol
- 1 sheet 240 grade sandpaper
- 1 sheet 360 grade sandpaper
- Motor-driven mixer or mixing stick/spoon
- 2 Containers for mixing HIREC Primer, and HIREC Base
- Weight scale (Metric system)
- Specialized primer roller
- Normal roller
- Paint tray or bucket/tray with grate
- Wet Thickness Gauge
- Dry Thickness Gauge

**DO NOT COAT HIREC WHEN THE AMBIENT TEMPERATURE  
DROPS BELOW 48°F**

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## HIREC 100 Materials



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## Instructions for Applying HIREC 100

### STEP 1: Surface Check

#### You will need

- Intended coating surface
- Small amount of HIREC Primer UP Base

1. Smooth any rough surfaces on the intended surface and apply an anti-corrosive coating. The surface should be even, and free from cracks, crevices, rust, etc.
2. If you intend to apply HIREC 100 to a painted surface, apply a small amount of HIREC Primer UP Base to confirm that there is no interaction with the existing paint, such as shrinking, peeling or dissolving.

### STEP 2: Masking

#### You will need

- Masking materials

1. Securely cover all other equipment and surfaces (including cords) in the vicinity of the intended surface with protective material (e.g., polyethylene sheets, masking tape, etc.)

### STEP 3: Surface Preparation

#### You will need

- Lint-free Cloth (Brush for cleaning)
- Cleaning alcohol
- 240 grade sandpaper
- 80 grade sandpaper (If the intended surface is very rough)

1. Wipe the surface with a Lint-free cloth dampened with paint thinner or cleaning alcohol to remove any oily substances such as machine oil, grease, etc. Wipe off any water on the surface with a Lint-free cloth. Allow the surface to completely air dry. (We do not recommend using water to clean the surface, since it takes time to completely dry.)
2. To improve adhesiveness and water-repelling performance, gently rub the surface with 240 grade sandpaper both vertically and horizontally to remove shine and deteriorated layers.
3. For FRP (Fiber-Reinforced Plastic) surfaces, use sandpaper or a power brush to remove deteriorated resin and exposed glass fibers.
4. After preparing the surface, use a brush or Lint-free cloth dampened with paint thinner or cleaning alcohol to remove any dust particles. **Do not use bare hands.**

### STEP 4: Primer Coat

#### You will need:

- HIREC Primer UP Base
- HIREC Primer UP Hardener
- Weight scale
- Mixing container
- Lint-free cloth (Brush for cleaning)
- Paint bucket/tray with grate
- Roller for primer coating
- Intended surface
- Brush or air gun (if there are difficult-to-reach areas with roller)

#### **Spreading rate: 170g/m<sup>2</sup>**

(HIREC Primer UP Base and Hardener weight before dilution with HIREC Primer Thinner)

#### **Wet layer thickness: 75~100µm**

Primer coating does not last longer than half a day once the compositions are mixed

Primer Preparation

1. Open the can of HIREC Primer UP Base and stir until the contents become uniform. (The use of motor-driven mixer is recommended especially when mixing a large amount.)
2. Add HIREC Primer UP Hardener to the HIREC Primer UP Base. See note below. Stir for approximately 5 minutes until the mixture becomes uniform and there is no sediment at the bottom of the can.



Primer Composition	Base-to-Hardener Mixing Ratio (weight %)
Standard	90:10
With Color	85:15

**Note: When mixing whole cans of the HIREC Primer UP Base and Hardener, the proper mixing ratio will be achieved. If you are using only a portion of the Primer UP Base, use a weight scale to measure accurate amounts of each to achieve the proper mixing ratio, and immediately seal up the remaining materials. Mix according to weight ratio, not volume ratio.**

3. Use a weight scale to add the proper amount of HIREC Primer UP Thinner between 0–25 weight % depending on the ambient temperature as indicated in the table below. Stir for approximately 2 minutes until the thinner is uniformly mixed.

**Dilution Value (weight %)**

Ambient Temperature		
50°F (10°C)	68°F (20°C)	86°F (30°C)
10–20	5–15	5–15

**Note: If the amount of HIREC Primer UP Thinner to mix with HIREC Primer UP Base is uncertain, start by adding about 10 weight % of HIREC100, and add more HIREC Primer UP Thinner if primer coat is too thick to apply to the intended surface.**

Equipment Preparation

4. Prepare the following piece of equipment for applying the primer:
  - a) **Roller for Undercoat:** Specialized roller, or wool roller  
(\*This roller can be purchased from NTT-AT.)

Special Care

5. Any uneven or hard-to-reach areas that may be difficult to coat with standard roller application methods should be coated with primer in advance using a spray gun or brush.

### Application Preparation

6. Add the primer mixture to a paint bucket or tray
7. Dip the roller in the paint and roll it on the grate by applying some pressure for about 10 times to let the air out from the roller
8. Repeat the previous step 3 three times.
9. After loading the roller, gently shake it up and down 5 or 6 times to make sure it does not drip.

### Applying Primer

Spreading rate: 170g/m<sup>2</sup> (weight before dilution)

Wet layer thickness: 75~100µm

10. Apply the primer by drawing a small “W” repeatedly at first, then paint it again with up and down strokes to make the coating even. Make sure to sweep through the coating surface, so that there would not be a blob of primer at the end of the surface. In other words, do not stop the roller at the surface edge, but lift the roller at the edge and roll across the surface edge. The primer coated surface should look smooth.
11. Use the wet gauge and check that the thickness is 75~100µm. It becomes 30 to 40µm thick when dried.

### Drying

12. When the application of the Primer Coating is complete, allow the wet primer surface to dry for the approximate period of time indicated below:

Temperature	45°F (7°C)	50°F (10°C)	68°F (20°C)	86°F (30°C)
Time (Hours)	120	48	24	16

**Note: Painting when the ambient temperature is above 68°F is recommended**

### Hardness check

13. To test whether the primer coating has completely hardened, apply a small amount of HIREC Primer UP Thinner to confirm that there is no shrinking peeling, or dissolving the primer coating.

## STEP 5: Top Coat

### **You will need:**

- HIREC100
- HIREC100 Thinner



- HIREC100 roller
- Weight scale
- Mixing container
- Motor-driven mixer or mixing stick/spoon
- Paint bucket/tray with grate
- Brush or air gun (if there are difficult-to-reach areas with roller)
- Lint-free cloth (Brush for cleaning)
- Cleaning alcohol
- 360 grade sand paper
- Brush or air gun (if there are difficult-to-reach areas with roller)

**Spreading Rate: 250g/m<sup>2</sup>** (HIREC100 weight before dilution with HIREC100 thinner)  
 Top coat does not last longer than a day once the compositions are mixed

#### HIREC100 top coat Preparation

1. Open the can of HIREC 100 and stir or shake the can until the contents become uniform. (A motor-driven mixer is recommended if preparing a large amount.)
2. Add HIREC 100 Thinner for dilution and stir for approximately 3 minutes until the contents become uniform. Standard quantity for dilution is indicated below:

#### **Dilution Value (weight %)**

Ambient Temperature
45–86°F (7–30°C)
30 weight%

(ex. HIREC100-100g, HIREC100 Thinner -30g)

#### Equipment Preparation

3. Prepare the following piece of equipment for applying the top coating:

**Roller:** specialized HIREC top coat roller  
 (\*This roller can be purchased from NTT-AT.)

#### Surface Care

4. Gently rub the primer-coated surface with 360 grade sandpaper to remove shine and any deteriorated layers, then wipe the surface with cleaning alcohol.
5. Any uneven or hard-to-reach areas that may be difficult to coat with standard roller application methods should be painted in advance using a spray gun or brush.

#### Application Preparation

6. Load the roller with the mixture of HIREC 100 and HIREC thinner as follows. This procedure is imperative for proper application of HIREC 100. Please be sure to follow the directions exactly.
7. Add the mixture of HIREC100 and HIREC Thinner to a paint bucket or tray Fill the bucket or paint tray with HIREC 100

8. Dip the roller in the HIREC100 mixture and roll it on the grate by applying some pressure for about 10 times to let the air out from the roller
9. Repeat the previous step 3 three times.
10. After loading the roller, gently shake it up and down 5 or 6 times to make sure it does not drip.

### Applying Top Coat

Paint with the roller as follows.

Spreading Rate: 250g/m<sup>2</sup>

**Caution: If the roller is not rolling when applying HIREC, the surface will be not coated properly. It is recommended that you practice the painting motion in advance. It is sometimes easier to move the roller away from you to make the roller roll properly.**

11. Precoat by roughly covering the entire surface. Apply the HIREC100 as if writing a large "W" repeatedly. This is a wash coat. Apply the HIREC100 in a thin layer over the entire surface. Do not worry about evenness or appearance that much at this point.
12. Let the surface dry until the solvents have evaporated, and the surface is no longer shiny. The paint changes appearance from white to slightly transparent in about three to ten minutes.
13. Load the roller with HIREC100 (but not enough to drip), and spread the paint over the surface by drawing small "W" repeatedly, then paint it again with up and down strokes to make the coating even. Load the roller often. Make sure to sweep through the coating surface, so that there would not be a blob of paint at the bottom. Another words, do not stop the roller at the bottom.
14. Let the surface dry until the solvents have evaporated, and the surface is no longer shiny. The paint changes appearance from white to slightly transparent in about three to ten minutes.
15. Cover the remaining HIREC100 with plastic between coats to prevent the thinner from evaporating.
16. Repeat steps 3~4 three times. Turn the intended surface, so that strokes for each application are in different directions.

### Check and Touch-up

17. If the painted surface has missed areas, scratches, etc., apply additional paint to the areas in need of reapplication. In the case a deep scratch down below the Primer coating, reapply Primer coating to the affected area as needed and allow to dry before reapplying the top coating.

### Drying

18. Allow sufficient time for the surface to dry and hardens (12 hours or more) before handling or packaging.
19. Water-repelling performance will be diminished if the painted surface is disturbed before completely dry. Take precautions when handling or packaging.

**Note: Wet Surfaces coated with HIREC 100 are very slippery. Do not place any objects on HIREC 100 coated surfaces.**



**For Application and Sales Assistance, please contact:**

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# Targeted State Checking Criteria (HIREC100)

--Use this sheet with the instructions--

## STEP 1: Surface Preparation

- No defects, such as rust, expansion or cracks, on the targeted surface. Any holes, bumps, and laitance are treated.
- No potential damage by interaction with the existing coat on the targeted surface.

## STEP 2: Masking

- The proper area is masked adequately.

## STEP 3: Surface Treatment

- No oil or water is observed on the targeted surface.
- Shine is eliminated from the surface by sandpaper.
- Any kinds of particles (dust, glass fiber, and etc.) are not causing bumps on the surface. Make sure no dust from sanding is present.

## STEP 4: Application of Primer Coating

### Paint Preparation

- The painting material is what directed in the instruction.
- No lumps at the bottom of the can. Contents are mixed thoroughly
- Ratio of the mixing paints are exactly as directed, and combined contents are mixed thoroughly
- Only use HIREC dedicated thinner.
- Viscosity of paint is adjusted by the amount of thinner depending on painting environment.

### Equipment Preparation

- Equipment is appropriate and in good working order.

### Special Care

- Parts where normal coating is difficult should be painted in advance

### Painting

- Apply enough amount of primer as directed
- No paint drips, thin spot, or unpainted areas.

### Drying

- Secure enough time as directed on the instructions to dry

### Hardness Check

- Take extra care in checking if the surface is completely dry

## STEP 5: Application of Top Coating

### Paint Preparation

- The painting material is as directed in the instruction.
- No lumps at the bottom of the can. Contents are mixed thoroughly
- Ratio of the mixing paints are exactly as directed, and combined contents are mixed thoroughly
- Only use HIREC dedicated thinner.
- Viscosity of paint is adjusted by the amount of thinner depending on painting environment.

### Equipment Preparation

- Equipment is appropriate and in good working order.

### Surface Care

- Be careful not to expose the substrate

### Special Care

- Parts, where normal coating is difficult should be painted in advance.

### Application Preparation

- Roller is loaded enough

### Painting

- Precoating is done
- No poorly painted, cracked, or unpainted areas.
- Roller streak line should only be up and down direction at the end.

### Check and Touch-up

- Imperfection is treated and fixed

### Drying

- Secure enough time directed on the manual to dry.
- Do not touch the coated surface.